



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/509,212	09/24/2004	Robert K Rosen	43225-62465AUSP	5115
51738 7590 01/16/2007 BAKER & MCKENZIE LLP Pennzoil Place, South Tower 711 Louisiana, Suite 3400 HOUSTON, TX 77002-2716			EXAMINER CHOI, LING SIU	
			ART UNIT 1713	PAPER NUMBER
SHORTENED STATUTORY PERIOD OF RESPONSE		MAIL DATE	DELIVERY MODE	
3 MONTHS		01/16/2007	PAPER	

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

**Office Action Summary**

Application No.

10/509,212

Applicant(s)

ROSEN ET AL.

Examiner

Ling-Siu Choi

Art Unit

1713

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>12/20/2004</u> . | 6) <input type="checkbox"/> Other: ____.  |

### **DETAILED ACTION**

1. Claims 1-15 are now pending, wherein claims 1-9 are drawn to an article of manufacture and claims 10-15 are drawn to a method of functionalizing a polymer

### ***Claim Rejections - 35 USC § 112***

2. **The following is a quotation of the second paragraph of 35 U.S.C. 112:**

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1-15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1, lines 2-3, the recitation "molecular weight" causes indefiniteness because there is no base to cite such molecular weight. Is the molecular weight referred to weight average molecular weight, number average molecular weight, or something else?

### ***Claim Analysis***

Art Unit: 1713

## 4. Summary of Claim 1:

An article of manufacture, comprising
a <u>linear copolymer of ethylene and vinyl aromatic monomer</u>
having a molecular weight of less than 15,000
<b>wherein</b> the copolymer has a first and second terminal group:
the first terminal end group being a <u>methyl group</u> and
the second terminal end group being a <u>vinyl group</u>
<b>wherein</b> the <u>terminal methyl group / the terminal vinyl group = 0.8:1 to 1:0.8</u>

***Allowable Subject Matter***

5. Claims 1-15 are allowable over the closest references: Toyoda et al. (JP 2001-002731), Machida et al. (JP 2000-038418), and Machida et al. [US 6,169,154 B1 (or US 5,955,557)].

Toyoda et al. disclose a wax comprising a polymer having a vinyl type or a vinylidene type unsaturated bond at one side terminal of the polymer chain, which comprise ethylene and C<sub>3-10</sub>  $\alpha$ -olefin and has the molar ratio of ethylene and  $\alpha$ -olefin is (81-100)/(0-19) (abstract; wax: [0010]). Toyoda et al. further disclose that the weight average molecular weights of the polymers are exemplified to be 1,700, 3,000, or 4,600 (Table 1). Toyoda et al. furthermore disclose that a denaturation of an end unsaturated bond is carried out by the contact with maleic anhydride to provide a toner release agent or lubricant ([0163]; [0164]; [0173]). It is noted that Toyoda et al. is silent on another terminal group to be methyl group. Since the polymer is obtained via additional polymerization of ethylene and  $\alpha$ -olefin, the resulting polymer would contain a terminal

Art Unit: 1713

methyl group. Toyoda et al. further disclose that number of vinyl group per 1,000 carbon atoms (M) is given by the equation of  $M \geq 14,000/M_w$  (abstract). However, Toyoda et al. do not teach or fairly suggest a linear olefinic copolymer of ethylene and vinyl aromatic monomer and having the ratio of the terminal methyl group to the terminal vinyl group in the range of 0.8:1 to 1:0.8.

Machida et al.'418 disclose an olefinic macromonomer which satisfies the following requirements: (1) the weight-average molecular weight is 200-100,000; (2) the ratio of vinyl group in total unsaturated terminal is  $\geq 60\%$ ; and (3) the content of ethylene or propylene is greater than 50 mol.% (abstract). However, Machida et al.'418 do not teach or fairly suggest a linear olefinic copolymer of ethylene and vinyl aromatic monomer and having the ratio of the terminal methyl group to the terminal vinyl group in the range of 0.8:1 to 1:0.8.

Machida et al.'154 disclose a branched ethylenic macromonomer which can function as a comonomer to provide a copolymer having excellent molding and working properties, the branched ethylenic macromonomer has (a) a molar ratio of a terminal methyl group/a vinyl group in the range of 1 to 100; (b) a ratio of vinyl groups to the total unsaturated group in the macromonomer being 70 mol% or more; and (c) a weight-average molecular weight of the macromonomer is in the range of 100 to 20,000 (abstract; col. 6, lines 45-58). Machida et al. further disclose that the branched ethylenic macromonomer comprises ethylene and "at least one selected from the group consisting of  $\alpha$ -olefins having 3 to 20 carbon atoms, cyclic olefins and styrene" (col. 5, lines 61-65). However, Machida et al.'154 do not teach or fairly suggest a linear olefinic

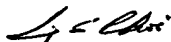
Art Unit: 1713

copolymer of ethylene and vinyl aromatic monomer and having the ratio of the terminal methyl group to the terminal vinyl group in the range of 0.8:1 to 1:0.8.

***Conclusion***

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ling-Siu Choi whose telephone number is 571-272-1098.

If attempt to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu, can be reach on 571-272-1114.



LING-SUI CHOI  
PRIMARY EXAMINER

January 3, 2007